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GROWING CHERRIES EAST OF THE ROCKY MOUNTAINS

H. P. GOULD

Senior Pomologist, Division of Fruit and Vegetable Crops and Diseases,
Bureau of Plant Industry



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By H. P. GOULD, *principal horticulturist in charge, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry.*

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EXTENT AND DISTRIBUTION OF CHERRY GROWING.

THE FIFTEENTH CENSUS (1930) shows for the entire country a total of 8,381,472 cherry trees of bearing age and 4,615,286 not of bearing age. Next to the peach and the apple, no tree fruit is grown more widely throughout the country than the sour cherry. The distribution of sweet cherries is more restricted. The more than 8,300,000 cherry trees of bearing age reported by the last census are distributed in every State in the Union and range in number from less than 800 in Rhode Island to more than 1,180,000 in Michigan, nearly 975,000 in California, 875,000 in New York, followed by a number of other States having from around 200,000 to 600,000 each. In some States having a relatively large number the commercial interests are small. The trees are distributed rather generally throughout the States, principally as small orchards, the fruit of which is rarely shipped, though in many cases it may be sold in local markets.

In the decade 1920 to 1930 the number of bearing cherry trees in the country decreased by about 2,400,000. There was an increase of more than 900,000 trees of nonbearing age during this period.

Climate is the most potent limiting influence in the distribution of fruits so far as the natural surroundings are concerned. Of the various elements of climate, temperature probably governs oftener in this respect than any other single factor. This becomes evident in the distribution of cherries.

Cherry trees do not thrive well as a rule where the summers are particularly long and hot. For this reason more than any other they are grown but little in the South, and to the limited extent they are

planted in that part of the country the best success is attained at the higher altitudes.

In their endurance of low temperatures, the widely grown sour-cherry varieties approach the apple varieties which are grown commonly in the northern commercial apple-producing districts.

The most important commercial sour-cherry orchards are located in the Hudson River Valley, in western New York, western Michigan, northern Ohio, the Arkansas River Valley in Colorado, and in Larimer County in the north-central part of that State, Door County, Wis., parts of Iowa, and to some extent in other States. Large quantities of cherries in the aggregate are produced in States and sections not specifically mentioned, but as a rule the orchards are small and do not represent important community interests.

The leading varieties of sweet cherries are less hardy than the best known sour sorts. Their endurance of cold corresponds more nearly to that of the peach. It may be doubted whether sweet cherries as a group endure long hot summers any better than the sour sorts, possibly not as well.

The most important sweet-cherry producing regions are in the Pacific Coast States, where the sour cherry has been almost unknown until recently. The 1930 census shows large increases since 1920 in cherry trees not of bearing age in Washington and Oregon. Some of these are sour varieties. East of the Rocky Mountains the commercial production of sweet cherries is confined very largely to the Hudson River Valley, western New York, and western Michigan. In the two latter sections the climate is much modified by the influence of the Great Lakes. While sweet-cherry trees are more or less widely distributed throughout a large portion of the country the number of trees aside from those in the sections mentioned is comparatively small.

LOCATIONS FOR CHERRY GROWING.

In selecting a location for cherry growing—that is, the general region or community in which the enterprise is to be developed—several things need to be considered with much care. The general relation between climatic conditions and the geographic distribution of commercial cherry culture has been mentioned. As the fruit is very perishable, quick transportation to market is essential, and also refrigerator service if the fruit is to be shipped long distances; and, further, a relatively large crew is required to handle the fruit properly. Large orchards therefore should not be located where it is practically or economically impossible to assemble and care for the requisite labor to handle the fruit properly.

SITES FOR CHERRY ORCHARDS.

The "site" is the exact piece of land occupied by the trees. The same general factors which require consideration in selecting a site

for an apple or peach orchard need to be taken into account in choosing sites for cherries. The most important of these factors are soil and local climatic conditions.

Cherry trees thrive on a wide range of soil types, provided the soils are well drained. There is, perhaps, no fruit tree more sensitive to the ill effects of a poorly drained soil than the cherry. In many important cherry-growing regions the prevailing types of soil are rather light—sandy, sandy loams, and other light loams—commonly underlain with a more or less clayey subsoil. Such soils characterize the areas bordering the Great Lakes, where the most important commercial interests east of the Rocky Mountains are located. However, the industry doubtless has developed in these regions because of the climatic conditions which are induced by the large bodies of water that they adjoin rather than because of the existence there of any particular soil types; but, as the heavier clayey types are often extremely retentive of moisture or otherwise insufficiently drained for good results with cherries, it obviously follows that the comparatively light soils are preferred for this fruit. For sweet cherries the lighter, warmer types are usually regarded as essential for successful results. Soils that are especially "droughty" and dry out excessively are unsatisfactory for either type of cherry. Moderately productive soils give better results than those which represent either extreme in fertility.

The temperature factor in its influence on the geographic distribution of cherry growing has been mentioned, but in its relation to local conditions this factor also requires consideration. Cherries blossom comparatively early, the sweet sorts earlier in most cases than the sour varieties; therefore, sites that are subject to spring frosts during the usual blossoming period should be avoided.

As cold air settles to the lower levels, orchards occupying sites somewhat higher than the surrounding areas are generally less liable to frost injury than those having a comparatively low elevation. The soil of the higher areas is also likely to be better drained than that which occupies the lower levels.

PROPAGATING CHERRY TREES.

The details of propagating cherry trees are of little direct importance to the average grower, as he will usually find it to his advantage to buy trees from a reputable nurseryman. Trees are propagated by budding on seedling stocks in the nursery row and are commonly sold for planting either as 1 or 2 year old trees. Trees which have made one season's growth in the nursery are designated as 1-year-old trees; by the same rule, a 2-year-old tree is one that has made two seasons' growth from the bud, though it may lack several months of being 2 years old.

STOCKS FOR CHERRY TREES.

Though the average cherry grower rarely has occasion to propagate cherry trees himself, the kind of stock on which his trees are propagated is a matter of importance to him.

Two kinds of stocks, the mahaleb¹ and mazzard,² are in common use. These are two distinct types of cherries, which are of value for stocks but unimportant for their fruit.

The mahaleb is used much more extensively than the mazzard, and for the sour varieties it generally gives fairly good satisfaction. While the mahaleb is much used in propagating sweet cherries, growers who have studied the matter carefully are closely in accord in their conviction that the sweet sorts give much better results when grown on mazzard than on mahaleb stocks. The mazzard stock appears to increase the vigor and length of life of trees of some varieties propagated on it in comparison with the mahaleb.

Moreover, some growers express a definite preference for the mazzard as a stock for sour as well as for sweet cherries, their choice being based on the stronger and more vigorous growth sometimes made by trees propagated on mazzard stocks when compared with those on mahaleb stocks grown under the same conditions.

From the nurseryman's standpoint the mazzard is a rather difficult stock to use. Its condition with reference to budding is quickly influenced by weather factors; if they are unfavorable, the buds may not "take" readily.

The common wild "bird" or "pin" cherry³ has been used to a limited extent in some sections for stock purposes, but it is unimportant in comparison with the others mentioned.

TREES FOR PLANTING.

The selection of trees suitable for planting is fundamental to the success of an orchard. To plant a poor tree is to start with a handicap that may continue throughout the life of the orchard. The purchase price of a poor tree may be a few cents less than that of one of high grade, but the economy of the transaction ends with its purchase. Everything else costs substantially the same as for a high-grade tree. Real economy consists in paying reasonable prices for high-grade trees. If only a definite amount can be expended for trees, it is better to secure a small number of good, strong, well-rooted, well-formed trees than to buy a larger number at the expense of quality. An altogether desirable tree is difficult to describe, especially as different planters have different ideals. The desirability of a tree is not measured by size alone. While a small, inferior tree

¹ *Prunus mahaleb*.

² *Prunus avium*.

³ *Prunus pennsylvanica*.

should be avoided because it is not likely to grow well even when planted under favorable conditions, a very large, overgrown tree is scarcely better. Unless handled with extreme care, the largest grades do not endure the check incident to transplanting as well as thrifty medium-sized trees.

In the past, 2-year-old trees have been planted, as a rule, by cherry growers, but there is evidently a growing preference for trees that have made only one season's growth in the nursery. Good-sized 1-year-old trees usually give satisfaction. They are light to handle, transportation charges are less than for the heavier trees, the root systems are but little reduced in digging from the nursery, they start into growth readily, the tops can be formed largely in accordance with the grower's own ideals rather than the nurseryman's, and the cost is usually a little less than for older trees of corresponding grades.

The different grades are commonly designated by the height of the trees, as 3 to 4 feet, 4 to 5 feet, 5 to 6 feet, etc. The size of the trunk, or caliper, is sometimes considered and designated as follows: Five-eighths to three-fourths, 4 to 5 feet; three-fourths up, 5 to 7 feet, etc. Here the fractions denote in parts of an inch the diameter of the trunk just above the point of union of stock and bud, and the whole numbers indicate the height of the trees. In the last form, "three-fourths up" means trees having a diameter of trunk of three-fourths of an inch or more. Still another method is where the height of the different grades overlaps, as 4 to 5 feet, $4\frac{1}{2}$ to 6 feet, 5 to 7 feet, these terms being equivalent to small, medium, large. These grade designations are based on caliper as well as height, though the caliper is not stated. Thus, a tree 6 feet high, if it has sufficient caliper goes in the 5 to 7 foot grade; otherwise, it may be put in the $4\frac{1}{2}$ to 6 foot or medium grade.

The relative significance of these grade terms will be better understood by referring to figures 1 and 2 and the explanations which accompany them.

THE SEASON FOR PLANTING TREES.

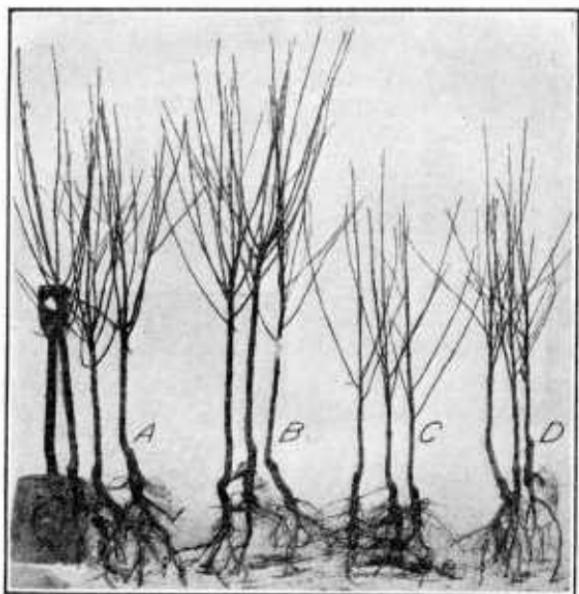
In regions where the winters are severe and trying, spring planting is advisable. Such conditions occur in the North, where the temperature drops very low, and in the Great Plains area, where, in addition to low temperatures, the winters are very trying because of the limited supply of moisture both in the soil and in the atmosphere. In the middle latitudes and wherever the winters are comparatively mild, fall planting generally is preferable.

One factor in spring planting needs to be observed with special care. The buds of cherry trees swell and start into growth very

early. If they start to any considerable extent before the trees are planted, a high percentage of failure is likely to occur. Therefore, particular pains should be taken to hold the trees in a perfectly dormant condition until they are set out, very early planting usually being the wisest plan.

HANDLING THE TREES WHEN RECEIVED FROM THE NURSERY.

The trees should be unpacked immediately after delivery and every possible precaution taken to prevent the roots from becoming dry. Unless the number of trees is so limited that immediate planting is possible and the time for doing it is at hand, they should be heeled in. For this purpose a thoroughly well drained place where the soil is mellow and deep is required.



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FIG. 1.—Sour-cherry trees representing different grades of nursery stocks, as follows: *A*, 2-year-old Large Montmorency on mazzard stocks, three-fourths inch up, 5 to 7 feet; *B*, same as *A* except that trees are on mahaleb stocks; *C*, 1-year-old Montmorency on mazzard stocks, five-eighths to eleven-sixteenths inch, 3 to 4 feet; *D*, 1-year-old Large Montmorency on mahaleb stocks, five-eighths to eleven-sixteenths inch, 3 to 4 feet.

number of trees are to be heeled in, they are usually placed in closely adjacent rows. Where this is done, the trees in one row may be covered with the soil which is removed in opening the adjacent trench.

Trees that are tied in bundles when received must be separated before they are heeled in. If this is not done it is difficult to work the soil among the roots sufficiently to prevent them from drying to a serious extent. If it is necessary to leave trees heeled in over winter, they should be placed in a nearly horizontal position, so that the entire trunk below the branches can be covered with soil, for protection.

If a large

• them.

PREPARING THE LAND.

The ideal preparation of the soil for cherry trees consists of deep plowing and thorough pulverizing with a harrow or cultivator. The preparation should be hardly less thorough than for corn, potatoes, or other hoe crops. Though various compromises on this ideal may be possible without defeating the ends in view, any temporary gain through a course that falls short of a thorough and deep working and fining of the soil will usually be more than offset by the results that follow.

PLANTING THE TREES.

Cherry trees are planted at various distances apart, depending upon the topography of the land, the fertility of the soil, the varietal characteristics of the trees, and the preferences and conceptions of the individual grower. For most sour varieties, 20 by 20 feet is generally accepted as satisfactory. Many who have orchards of trees of considerable age that are planted closer than this concede that they are too near together. Occasionally a grower is found who is convinced that 22 or even 25 feet apart each way gives none too much space for the strong-growing varieties like the Montmorency. Some of the smaller-growing sorts, such as the English Morello, are sometimes planted 16 or 18 feet apart each way with good success.

The ill effect of too close planting is suggested in figure 4, which shows a Montmorency orchard about 21 years old in which the trees

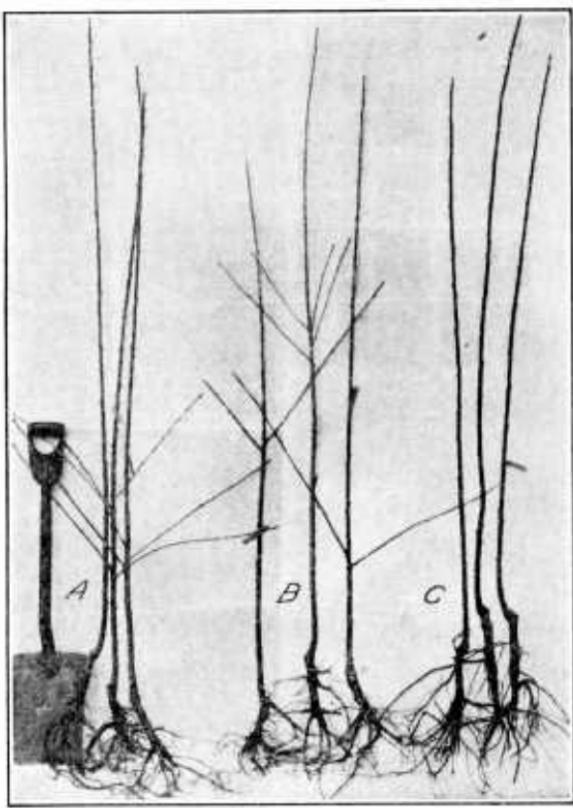


FIG. 2.—Sweet-cherry nursery stock: *A*, 1-year-old Windsor trees on mahaleb stock, five-eighths to eleven-sixteenths inch grade (the branching is characteristic of this variety); *B*, same as *A* except that the trees are on mazzard stocks; *C*, 1-year-old Schmidt trees on mahaleb stocks, five-eighths to eleven-sixteenths inch grade.

are 14 feet apart each way. The branches interlock, so that spraying is difficult; they are long, slender, and upright in position, and hence it is difficult to gather a considerable part of the crop.

A good many sweet-cherry trees have been planted 20 by 20 feet, but this is admittedly too close. Probably 25 feet each way is the minimum distance advisable for sweet cherries, while not a few growers prefer from 28 to 32 feet each way, in the conviction that in the end the greater amount of space is more satisfactory.

East of the Rocky Mountains commercial plantings of sweet cherries have been made almost invariably in connection with sour varieties, and with few exceptions comprise but a very small pro-

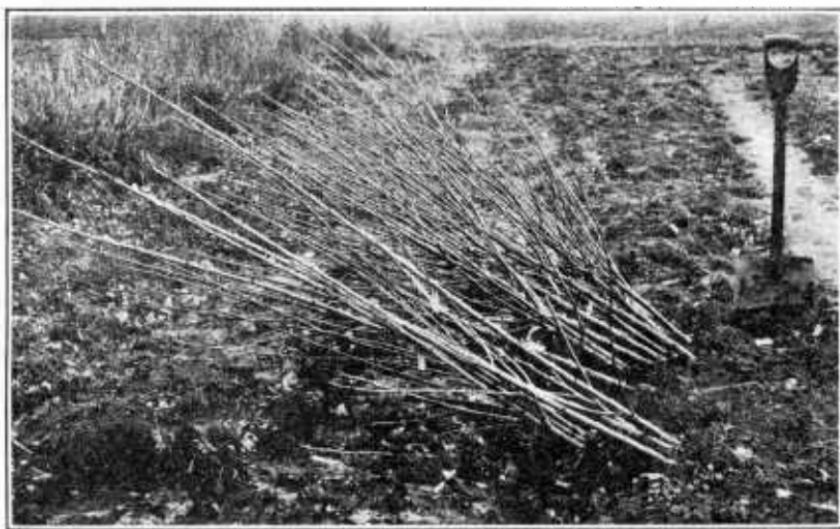


FIG. 3.—Cherry trees heeled in.

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portion of the orchards in which they occur. It is therefore a matter of convenience to space the trees of the sweet varieties the same as the sour sorts; but because of the much larger size attained by the former more space should be given them wherever possible.

The details of planting the trees, so far as placing them in the ground is concerned, do not differ from those usually followed with apples, peaches, or other fruit trees commonly planted in the sections where cherries are grown.

In preparing a tree for planting, all mutilated or injured portions of the roots should be trimmed off and long, slender roots, if they occur, cut off to correspond with the length of the main roots.

In handling the trees every precaution should be taken to prevent the roots from becoming dry. Undue exposure during the period that elapses between the trimming and the planting of the

trees will injure them. This danger can be eliminated largely by puddling the roots as soon as trimmed. This consists in dipping them in a puddle of clay. The puddle should be of such consistency that a thin layer of mud will adhere to the roots when dipped into it. Such a coating of mud will afford considerable protection, though even with this treatment the exposure of the roots to sun and wind should be reduced to a minimum at all times. If only a few trees are to be planted, it may be more convenient to protect them by keeping the roots covered with wet gunny sacks or some other coarse fabric.



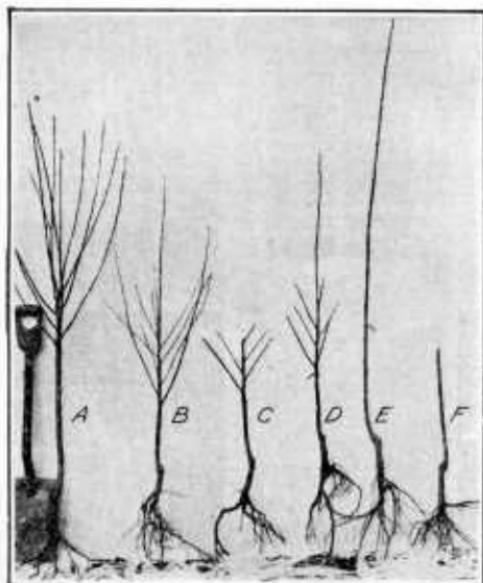
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FIG. 4.—A Montmorency cherry orchard about 21 years old. The trees stand 14 feet apart each way. They are tall and the branches are long and slender, as a result of being planted too close together. (New York, May 6.)

In planting the trees after they have been prepared as above suggested, several very important precautions must be observed if the desired success is to be realized. In filling the hole after a tree has been put into position and properly aligned only finely pulverized soil should be used. In this part of the operation much care should be taken to work the soil in closely about the roots. This may be done to some extent with the fingers. Moving the tree up and down very slightly as the hole is being filled will also materially help to settle the soil among the roots. As the filling progresses the soil should be firmly tamped about the roots, and when completed the hole should be filled even with the surface.

PRUNING AT THE TIME OF PLANTING.

Wide differences exist in the manner of pruning and forming the tops of the trees at planting time, though they may be grouped into two general methods: (1) Forming the top with three to five or six main



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FIG. 5.—Cherry trees of the grades illustrated in figures 1 and 2, showing the methods of shaping the tops used when planted: *A*, a 2-year-old Large Montmorency, unpruned; *B*, a 1-year-old Large Montmorency, unpruned; *C*, same as *B*, pruned to be grown with an open center; *D*, a 1-year-old Large Montmorency, pruned to be grown with a central leader; *E*, a 1-year-old Schmidt, unpruned; *F*, same as *E*, headed back ready for planting.



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FIG. 6.—A 2-year-old sour-cherry tree soon after it was planted. It represents one of the larger grades. The top has been shaped with a view to following the open-center method of pruning.

framework branches of equal importance, and (2) forming the top with a central leader and with several secondary branches which radiate from it. A practice followed by not a few is to plant the tree without shaping the top and with little or no heading back of the branches or other pruning. This practice calls for no comment other than a statement of disapproval. The two principal methods, however, require discussion in considerable detail.¹

The method most widely used is where the top is formed of several main frame or scaffold branches. This method properly fol-

¹ Suggestions as to the details of planting trees in semiarid regions may be found in Farmers' Bulletin 727, U. S. Department of Agriculture. (Gould, H. P., and Grace, O. J., Growing fruit for home use in the Great Plains area, 34 p., 25 fig. 1929.)

lowed produces a tree with an "open center." The other or "central-leader" method of forming the tree is used by most growers in Door County, Wis. The manner of shaping trees when they are planted in accordance with these two methods or ideals is shown in figure 5.

The open-center method of shaping a tree at the time it is planted is further illustrated in figure 6, which shows a large-sized 2-year-old tree shortly after planting but before growth had started. The four branches which are symmetrically placed have been retained to form the permanent head, the central stem of the tree has been removed, and the limbs which thus form the framework of the top have been headed back somewhat. As received from the nursery, this tree was headed about 3 feet high. This is too high to suit many growers, though it probably represents an average 2-year-old tree of large-sized grade handled by most nurseries. In planting 1-year-old cherry trees, growers in many cases head them at not more than 18 to 24 inches in height.

Figure 7 represents a sweet-cherry tree during its first season's growth. It was 2 years old when planted, and the top was formed for an open center.

Figure 8 shows a sour-cherry tree formed with a central leader when planted, now in its first season's growth. It is to be observed that the central branch or axis of the tree was not removed, as in the case of the tree

in figure 6. The top otherwise is formed much the same as in the method first described. If the central leader should be removed at the topmost branch, it would make a fairly ideal tree of the open-center type, with the framework consisting of six main branches.



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Fig. 8.—A sour-cherry tree planted in the spring and shaped as a central-leader tree. The principal difference between this tree and the one shown in figure 6 is the presence of the central axis of the tree which extends above the side branches.



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Fig. 7.—A sweet-cherry tree of the Schmidt variety. It was planted as a 2-year-old in the spring and shaped at that time with a view to its being pruned subsequently as an open-center tree.

TILLAGE AND MAINTENANCE OF SOIL FERTILITY.

Tillage refers to the work done with the plow, harrow, cultivator, or such other implements as may be used in working the soil after the trees are planted. The word "cultivation" is commonly used in the same sense.

As a rule, commercial cherry orchards are given clean tillage during the growing season, or until about the middle of July. The principal exception to this practice is where an orchard in a high state of cultivation is seeded to clover or some other suitable crop and maintained for a season or two on a sod-mulch basis. There is a great difference, however, in clean tillage as practiced by different growers. The ideal of some requires that their orchard be cultivated twice a week during the active growing period of the trees; others are satisfied with three or four cultivations during the entire season.

The tillage of orchards can not be governed by arbitrary rules. In general it may be said that good tillage for a peach orchard would be likewise good tillage for a cherry orchard. The object is to conserve moisture by maintaining a finely pulverized surface mulch of soil until midseason. If the tillage which an orchard receives accomplishes this in full measure, other important results that have to do with the fertility of the soil will generally follow. Where the fruit is picked by the middle of July, at least one cultivation after the harvest may be desirable.

As cherries when grown on mahaleb stocks are rather shallow rooted, deep plowing should be avoided. Some growers prefer to use only harrows or cultivators unless the end in view, such as the turning under of a cover crop, can be accomplished only by plowing.

Cover crops are used extensively in most important cherry-producing sections. These are generally put in at the last cultivation, whether that occurs before or after the fruit is picked. Vetch and red clover are the leguminous crops most commonly used in cherry orchards. Soy beans have been tried in a few orchards in Michigan and New York with good results. Rye, buckwheat, rape, and cow-horn turnips are the most common nonleguminous cover crops, the first two being used the most extensively. Several of these crops, particularly vetch and buckwheat, are so handled each year by some growers as to mature sufficient seed for their cover-crop needs the following year. This practice in a number of instances has proved not only to be satisfactory so far as the orchard is concerned, but also to effect a considerable saving in the cost of seed where it is used in quite large quantities.

An inquiry often received at the United States Department of Agriculture is "What fertilizers are good for cherries?" To this

question no specific answer can be made. In practice, cherry growers find that it pays to feed their trees fairly liberally. Many of them use commercial fertilizers in considerable quantities, but of various kinds and in different amounts, depending, if they are applied economically, upon experience that has indicated what foods are lacking in their soils.

As a rule, growers who have used well-rotted stable manure systematically in their cherry orchards value it highly. Some apply it in large quantities, even buying it in car lots at more or less distant points.

The principles of tillage, the maintenance of soil fertility, including the use of cover crops and rates of seeding, and suggestions about the use of fertilizers are discussed more in detail in Farmers' Bulletin 917,¹ to which the reader is referred in the present connection.

INTERPLANTED CROPS.

A fruit grower naturally desires some return from the land occupied by an orchard during the nonproductive period of the trees, where it can be secured without detriment to them. The most satisfactory crops to interplant are those which need the same general tillage as the trees, which do not compete too heavily for moisture, and for which there is a good market. Beans, peas, tomatoes, and other vegetables of like cultural requirements are examples of the least objectionable crops. Corn is frequently used and is not seriously objectionable unless the greed of the grower impels him to plant it too close to the trees. Potatoes are doubtful, in some sections at least, since digging them in the autumn might be equivalent to a late cultivation, resulting in the stimulation of tree activities at an undesirable time.

All small grains are seriously objectionable, as they permit no tillage. Strawberries in bearing are not usually cultivated until after the fruit is picked. Their fruiting period is during the time when tillage is of the greatest importance to the cherry trees. Though raspberries and blackberries admit of and require much the same tillage as cherries, their demands upon the soil moisture are so great that fruit trees frequently suffer seriously in competition with them, and their use in orchards is not advised.

These comments will serve to suggest the general features which need to be considered in selecting a crop for interplanting in cherry orchards. However, it must be remembered that an interplanted crop at best is in the nature of a makeshift, the only legitimate excuse for it being the need of reducing the cost of developing the orchard to

¹ U. S. Dept. Agr., Farmers' Bul. 917. (Gould, H. P. Growing peaches: Sites and cultural methods, 30 p., 27 fig.)

the bearing age. Though an orchard may endure an interplanted crop without appreciable ill effect, it is of no benefit to the trees unless the orchard receives better tillage than it would otherwise have. If the returns from the interplanted crop are sufficient to pay even approximately the cost of the tillage, the grower should regard himself as fortunate. The planting of an annual crop in an orchard is a system of double cropping, the more important crop being the trees. Though the tops require only a small part of the space above ground, the roots occupy a large portion of the soil much earlier in their lives than is commonly supposed.

IRRIGATION.

As this bulletin relates primarily to the growing of cherries in humid sections where irrigation is not practiced, no special comments concerning this operation are required here. However, cherry interests of considerable importance have been developed in one or two irrigated districts. This applies particularly to centers of production in the Arkansas River valley in Colorado and to certain other localities in that State east of the mountains.

PRUNING.

There is probably no other operation in the production of fruit concerning which there are such wide differences of opinion and practice as prevail with regard to the pruning of trees. The fact that trees often produce abundantly and regularly under practically all systems of pruning or with no pruning whatever forces the conclusion that dogmatic statements and rule-of-thumb directions are unsafe and unwise.

The notion has been long prevalent that cherry trees should not be pruned, that the wounds made in cutting off limbs do not heal readily, and that the operation is detrimental to the success of the trees. A good many growers have developed their orchards in accordance with this conception. These theories, however, do not appear to be well founded.

While cherry trees may require less pruning than some other fruits, the ill effects of allowing the tops to become very dense and bushy have become apparent in numerous cases. The most obvious effects of neglecting pruning have been the diminishing size of the fruit as the trees have grown older and its unevenness in ripening. A number of cherry growers who have had this experience have thinned the tops of their trees, opening them well to the sunshine and air. Following this, the fruit has developed to a good size and the crop has ripened uniformly, so that all of it could be harvested at a single picking.

- The pruning which a tree receives when planted and during the first two or three years thereafter has much to do with its future. Mistakes in forming the head or the results of neglect during the early years of its life are practically irreparable. On the other hand, if well formed and properly pruned during its first years the foundation for a good tree is established; subsequent errors in pruning, if they occur, may admit of correction without serious permanent harm to the tree.

The shaping of cherry trees at the time of planting has already been discussed. It is obvious that the two types of trees described—open center and central leader—must be treated quite differently in the subsequent pruning which they receive. These differences are outlined in the following paragraphs.

OPEN-CENTER TYPE.

SOUR-CHERRY TREES.

Figure 6 shows a sour-cherry tree shaped when planted to be grown as an open-center tree. During the first season after planting, two or three secondary branches usually develop from each of the limbs that comprise the framework of the tree. In pruning, the predominating idea should be the development of a strong, stocky tree, with a well-balanced, symmetrical head, which shall be sufficiently open to admit air and sunlight to every branch. Thus pruned, the development along the branches of a goodly number of strong, thrifty fruit spurs as the tree attains bearing age is favored.

Following the first season's growth after planting, some thinning out of the branches that developed during that season will usually be required. Two secondary branches are enough, as a rule, to leave on each main branch, unless others are needed to help make the tree symmetrical. Some heading back of the growth made that season is also advised, though some growers are opposed to cutting back at all. It is believed, however, that heading back the annual growth to some extent during the first two or three years after the trees are planted will result in a more stocky tree and one better formed for supporting heavy crops of fruit in later years than where the limbs are not headed back. The amount of heading back should depend upon the growth made the previous year. Where it is strong growers frequently cut back the limbs one-half or two-thirds of their length.

The annual pruning of sour-cherry trees until they come into bearing need not be materially different from that which follows the first season's growth in the orchard, as already described. The tops should always be kept open and the growth of the preceding season headed back more or less for two or three years at least. Comparatively little cutting back, however, is required after the trees reach

the age of 3 or 4 years, which is about the age at which most sour varieties come into bearing, though this time varies with the variety, location, and treatment.

Figure 9, which shows a Montmorency tree in July of its third season's growth in the orchard, further illustrates the pruning of

young trees. It was planted as a 2-year-old tree, which was headed sufficiently low in the nursery to permit forming the permanent head at a height of 18 to 24 inches, which is satisfactory in this respect. The branches were reduced to five or six in number when it was planted, those allowed to remain being symmetrically arranged about the trunk. They were also headed back rather heavily to outside

PI6679MP
FIG. 9.—A Montmorency cherry tree in its third season's growth from planting, pruned to an open center. (Michigan, July 9.)

buds, thus giving the tree a fairly spreading habit of growth. Following the first season's growth after planting, the branches were again headed back quite heavily. The only pruning following the second season's growth (which was the year prior to that shown in the illustration) consisted of cutting out the interfering branches and such other limbs as were necessary to keep the top fairly open.

Figure 10 shows a row of Montmorency trees in their sixth season's growth from planting. These trees are in the same orchard as the one shown in figure 9 and have been handled in the same manner. The trees were headed back quite heavily following the first season's growth. No further heading back has been done, though the cross branches have been removed annually and the tops kept well open to the sunlight and air. The main branches of the trees possibly would have grown more stocky had they been lightly headed back once or twice more before they were permitted to elongate in an indeterminate manner.

In figure 11 is shown a sour-cherry orchard, probably 15 or 16 years old, that has been fairly well pruned and the tops kept well



thinned of superfluous growth. The main branches have been headed back recently, to prevent the trees from becoming taller. The heads of these trees, however, are so high that very little of the fruit can be gathered without using ladders. In contrast, a very considerable proportion of the fruit can be gathered from the trees shown in figure 12 while the picker is standing on the ground. And further, the trunks of low-headed trees are better protected from sun scald, which is rather serious in some sections.

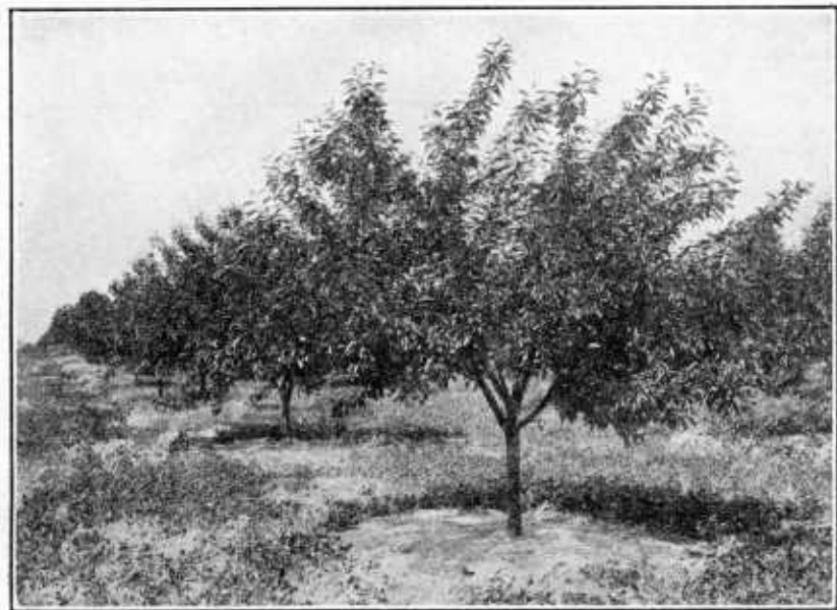


FIG. 10.—A row of Montmorency cherry trees in their sixth season's growth from planting. These trees were pruned to open centers when set out and are in the same orchard as the one shown in figure 9. The orchard, which is now in clover, had received clean cultivation prior to this season. (Michigan, July 9.)

SWEET-CHERRY TREES.

The growing of sweet cherries is confined largely to sections where the open-center type of tree prevails, and if any attention is given to pruning, the trees are usually developed on that plan.

The pruning of 1 and 2 year old sweet-cherry trees when planted is shown, respectively, in figures 5 (*F*) and 7. A sweet-cherry tree in its second season's growth after planting is shown in figure 13. This tree was not headed back following its first season's growth. The photograph from which this illustration is made was taken on May 12, before the second season's growth was far advanced. Doubtless some secondary branches developed later in the season, but

it may be assumed that they put forth near the ends of the branches as they appear in the illustration.

If the tree is allowed to grow each season with no heading back of the previous season's growth, a tree not unlike the one shown in figure 14 may be expected to develop. There is no evidence of the branches having been headed in at any time. New branches, developing each season, have put forth from buds near the ends of the previous season's growth. As a result, the branches are long, slender, and poorly adapted for supporting a fruit crop. While the development of an open-headed type of tree should be the aim in pruning, this one is much more open than is necessary for the ends in view.



P 16471 WP

FIG. 11.—A sour-cherry orchard of mature age, 15 or 16 years old. The trees have been pruned to open centers. The main limbs have recently been cut back to prevent the trees from becoming taller. (New York, May 6)

Most sweet varieties begin to bear by the time they are 6 to 8 years old. Up to this time they should be so managed that the limbs will become strong and stocky, and the tops should be kept sufficiently open to admit light and sunshine to every part of the tree where fruit spurs normally form.

The tree shown in figure 15 may be contrasted with the one in figure 13. The former is a Schmidt tree in July of its third season's growth; the latter a Windsor tree in May of its second season's growth. These two trees are not altogether comparable, as one is a year older than the other and being different varieties there may

be differences in their habits of growth. However, the contrast shows an essential feature of heading back. The tree in figure 15 is stocky and strong. Last season's growth was headed back somewhat, and the secondary branches are developing at such points as to prevent the formation of the long, slender sections between branches that appear in figure 13.

Figure 14 may be contrasted with figure 16 to show still further the desirability of judicious heading back from year to year. The latter shows a Windsor tree 13 years old that has been systematically and regularly pruned. It has recently been topped, to prevent it from growing taller. The pruning given during its earlier years



P8145HP

FIG. 12.—A Montmorency cherry orchard, showing low-headed open-center trees. Much of the fruit can be picked without using ladders. This orchard is irrigated as occasion requires. (Colorado, August 12.)

has resulted in a compact, strong tree, with a large bearing surface, yet the top is not so dense as to shade the fruit unduly.

DUKE CHERRY TREES.

The habit of growth of the "Duke" cherries is more or less intermediate between the sweet and sour sorts, some varieties more closely resembling the former and others the latter. As the "Dukes" are planted largely in those sections where the open-center type of pruning is practiced, it follows that most of the trees of this class are pruned according to that system. Well-formed trees of the Late Duke variety of different ages are shown in figures 17 and 18. This variety resembles the sweet cherry in habit of growth rather than the sour cherry.

The details of heading back and the extent of the annual pruning at the different ages, as well as other points in pruning, are features that call for good judgment, and that is largely a matter of experience.

CENTRAL-LEADER TYPE.

The central-leader type of tree is represented in practice by two general forms in which the difference depends upon whether the central limb is allowed to grow, or "lead," indefinitely or whether it is headed back at some point. The pruning of a central-leader



P16428HP

FIG. 13.—A sweet-cherry tree of the Windsor variety early in its second season's growth from planting. It has not been well headed in. (Michigan, May 12.)



P16423HP

FIG. 14.—A sweet-cherry tree of the Windsor variety 7 years old which has received little or no pruning since it was planted. (Michigan, May 12.)

tree when planted is shown in figures 5 (*D*) and 8. If the central branch is headed back somewhat when the tree is planted, it may be expected to develop as shown in figure 19. Numerous branches have grown from buds along the leader, and the place of the latter has been taken in a measure by a younger branch that developed from a bud near its top.

Figure 20 shows a tree planted as a 1-year-old that is now in its second season's growth. The central leader was not cut back, and it has continued to elongate from the terminal bud. The side branches were headed in but little or none at all. Figure 21 shows the same

tree after it had been pruned by the owner. The pruning consisted in thinning out the branches without any heading in. The central leader is clearly shown as a continuous stem throughout the entire height of the tree. Its upward extension can be checked at any time by simply heading it back. If this is done a tree similar to the one in figure 19 will result; but if the heading back is not done and if systematic pruning is neglected, an undesirable form, like the one in figure 22, may be expected. This tree is so tall that thorough spraying is difficult, picking the fruit is expensive, and it is not well shaped to sustain the weight of a good crop of fruit.

The annual pruning of a tree shaped with a central leader should consist of thinning out the branches, in order to keep the top open, and of such heading back as may suit the ideals of the grower.

The choice of these two types of trees—open center and central leader—is largely a matter of personal preference. It is claimed that a tree with a central leader will withstand storms and winds better than an open-center tree, but growers are not unanimous in this opinion.

FUNGUS DISEASES AND INSECTS AND OTHER PESTS.

Cherries are subject to a number of insect pests and fungus diseases that occur more or less commonly in most regions. The timely



FIG. 15.—A sweet-cherry tree of the Schmidt variety in its third season's growth from planting. The branches have been headed back with a view to developing strong, stocky limbs. (Michigan, July 10.)

P16882HP

and systematic use of insecticides and fungicides will usually prevent serious loss. Some varieties of sweet cherries crack badly, however, if weather conditions are unfavorable, and when cracking does occur it is difficult or even impossible to prevent losses from decay.

Among the commoner insects of economic importance in cherry growing may be mentioned the cherry aphid, curculio, and slug.¹



FIG. 16.—A sweet-cherry tree of the Windsor variety 13 years old that has been systematically pruned from year to year. (New York, June 30.)

are made for the more important troubles. Leaf-spot is one of the most difficult diseases to control. To accomplish it—

Sour cherries should be sprayed with lime-sulphur solution diluted at the rate of $1\frac{1}{2}$ gallons to 50 gallons of water or with Bordeaux mixture containing 3 pounds of bluestone (copper sulphate) and 4 pounds of lime to each 50 gallons of water. (1) As soon as the petals have fallen. (2) About three weeks later. (3) Directly after the fruit is picked.

Arsenate of lead at the rate of 1 pound of powder or 2 pounds of paste to 50 gallons of spray may be added for the control of insect pests.

Sweet cherries should receive the same treatment as the sour ones, except that lime-sulphur solution diluted at the rate of 1 gallon to 50 gallons of water should be the fungicide used. Bordeaux mixture should never be used on sweet cherries, because of the risk of severe injury.²

Birds exact rather heavy toll at times, especially from small orchards. The loss from large orchards is probably negligible in

¹ For more detailed information in regard to the control of cherry insects apply to the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

² From Farmers' Bulletin 1053. (Roberts, J. W., and Pierce, Leslie. Control of cherry leaf-spot. 8 p., 6 fig. 1919.)

The San Jose scale often attacks sweet-cherry trees, but rarely occurs so abundantly on sour varieties as to require spraying. Brown-rot on the fruit and leaf-spot on the foliage are perhaps the most widespread and destructive diseases. Other insects and diseases occur to some extent, but as a rule they are less serious than the ones named, and most of them can be controlled by the same applications of spray mixtures that

comparison with the relative economic value of the birds that eat the fruit. Various means of protecting the fruit from birds are used. Small trees in yards or gardens are sometimes covered with mosquito netting. The hanging of bright pieces of tin in the tree so that they will move freely in the wind has also been recommended. Mulberry trees are sometimes planted in close proximity to cherry orchards. Birds seem to prefer the fruit of the mulberry to cherries, and where there is an abundance of the former the cherry is said rarely to be touched by them. June berries may also serve a similar purpose in sections where they grow well.

PICKING AND HANDLING THE FRUIT.

Only a brief account of the harvesting and handling of cherries can be given here, but reference to the methods in common use in some of the important districts will be of interest to those who are not familiar with these features of the cherry industry.

PICKING.

The manner in which cherries are picked is governed in a measure by the disposition to be made of them. Where they are to be shipped to a distant market the stems must be left on the fruit. If they are pulled off, the juice will ooze from the fruit.

When harvested with the stems on, the picker carefully grasps at one time the stems of several fruits in a cluster and strips them from the tree by giving a slightly backward pull. If due care is exercised the stems will remain firmly attached to the fruit and the spurs will not be broken or otherwise injured. In one important cherry-growing region the common method of removing the cherries is by clipping the stems with scissors or shears. When pickers become



FIG. 17.—A Late Duke cherry tree 4 years old, pruned to an open center. (Michigan, May 12.)

accustomed to using shears, they usually object to doing it in any other way, though probably it is not quite so rapid a method as stripping the fruit by hand.

If the fruit goes to a cannery located in the immediate vicinity of the orchard it is commonly pulled from the stem. Canners usually pay more for fruit picked in this way than for that which retains the stems. They are saved the expense of stemming after the fruit reaches the cannery, and a given bulk of cherries without stems contains an appreciably larger quantity of actual fruit than an equal bulk with stems.

Fruit gathered by clipping the stems, however, is not desired by commercial canners, as the portion of the stem that remains on the fruit is too short to be removed by the mechanical stemmers commonly used.

Comparatively small receptacles are used by pickers when harvesting cherries. The handling of cherries in an orchard where the fruit is taken at once to a near-by cannery is shown in figure 23. Here the fruit is

FIG. 18.—Late Duke cherry trees 8 years old. The open-center type of pruning has been followed, but on account of the very upright habit of growth and the heavy foliage the individual branches are not visible. (Michigan, July 10.)

PI6690MP

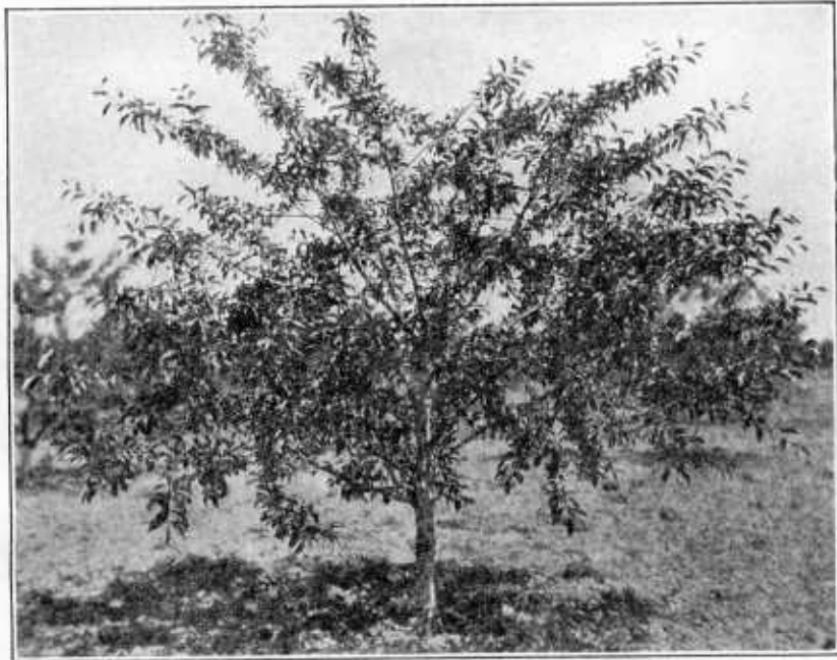
pulled from the stems. The picking pails in this case hold 5 quarts. The fruit is emptied from the pails into lug boxes, in which it is hauled to the cannery. In some instances 5 or 8 pound baskets are used also for picking, while other types of pails, baskets, or similar receptacles of 4 to 6 quarts' capacity are not uncommon among the average picking gang.

The pickers commonly attach the picking receptacles to themselves by passing a belt through the bails or handles, as may be seen in the case of the picker on the left in figure 24. Frequently, also, a hook is placed on the handle, thus making it convenient to hang the pail or basket on a limb or a rung of the ladder.



Under good crop and tree conditions an average picker will harvest 150 to 200 pounds of fruit, or about 3 to 4 bushels, in a 10-hour day. Exceptionally rapid pickers sometimes harvest as many as 400 pounds in a day.

Where the trees are headed low a good deal of the fruit can be picked without climbing, but to reach the fruit on the higher limbs stepladders or straight ladders are used, as shown in figures 24 and 25.



P16700HP

FIG. 19.—A Richmond cherry tree in its sixth season from planting, pruned when set out to a central leader of determinate growth. In time the central leader will largely disappear, and the top will be composed of branches of about equal size and importance. (Wisconsin, July 13.)

Picking is paid for usually by the pound or quart; sometimes by the gallon, case, or crate. In nearly all commercial orchards picking is piecework rather than daywork.

The assembling of an adequate number of pickers is a critical feature in the proper handling of a crop of cherries. The fruit should not be picked until it is ripe. When this stage is reached it should be moved very promptly; otherwise it will deteriorate. Under favorable conditions the period during which fruit on trees of the more important varieties may be harvested ranges from 5 or 6 to 10 or 12 days. In orchards where the fruit is ripening uniformly so that the trees can be stripped at one picking if desirable, a force of 8 to 12 pickers to the acre is not unusual.

It is not always an easy matter to decide just when cherries should be picked. The tendency is to pick as soon as they are slightly colored and before they are fully ripe. The fruits usually increase quite rapidly both in size and weight during the last two or three days before full ripeness is reached. Instances are reported of an increase in weight of 10 per cent by delaying picking for two days. Better flavor and quality are also secured by allowing the fruit to remain on the tree as long as consistent with the use to be made of it.

Various methods of handling the fruit after it is picked are followed by different growers. It may be packed in the orchard, as shown in figure 26, where baskets are used. In some sections a mov-



PI6720HP

FIG. 20.—A Richmond cherry tree in its second season's growth from planting, pruned when set out to a central leader of indeterminate growth. The side branches were headed back but little or not at all. (Wisconsin, July 14.)



PI6798HP

FIG. 21.—The same Richmond cherry tree shown in figure 20 after it was pruned by the owner. The pruning consisted entirely of thinning out the branches. No cutting back was done. (Wisconsin, July 14.)

able packing house is provided, a common type of which is seen in figure 27. This house is built on runners, so that it may be moved readily from place to place by a team. In this case, the fruit is placed by the pickers in veneer boxes holding 1 quart, and the boxes are packed in the 16-quart cases, or crates, seen at the right in figure 27.

In some cases where a grower puts up a fancy pack, it is necessary to sort and hand pack carefully every box or basket. A convenient table for such work is shown in figure 28. Because of the tender character of the fruit, only a relatively small quantity should be placed on a packing table at any one time. A table the size of the one here shown is large enough for two packers, one on either side.

PACKAGES AND PACKING.

Various styles of packages are used in shipping from the different sections. A 16-quart case or crate (fig. 27) is in general use in certain regions; the 15-pound California "lug" is used to some extent, as is the 4-quart climax basket. Locally the American and various other types of crates with 1-quart veneer filler baskets (fig. 29), commonly employed in shipping strawberries, are also used more or less.

COMMENTS ON VARIETIES.

Unlike the other widely grown deciduous-tree fruits, the bulk of the commercial cherry crop is made up of a small number of varieties. Even if all the varieties of minor importance are considered the number is still small when compared with such fruits as apples and peaches. It follows that the few really important varieties are very widely grown.

The sour varieties of primary importance east of the Rocky Mountains are the Richmond (*Early Richmond*), Montmorency (*Montmorency Ordinaire*), and English Morello (*Wragg*). Those of secondary importance can not be given as definitely, but Dyehouse, Large Montmorency, and Ostheim are representative sorts.

The sweet varieties of first importance east of the Rocky Mountains are the Tartarian (*Black Tartarian*), Windsor, Schmidt (*Schmidt's Bigarreau*), Napoleon (*Royal Ann*), and Spanish (*Yellow Spanish*). As in the case of the sour varieties, the number of



FIG. 22.—A Richmond cherry tree 18 years old. This tree evidently was pruned to a central leader when it was planted and has not received much attention as to pruning since. (Wisconsin, July 13.)

sweet sorts of secondary importance is rather indefinite. Early Purple, Knight (*Knight's Early*), Rockport, Wood (*Governor Wood*), and Elton occur more or less frequently.

Of the Duke varieties, May Duke, Late Duke, and Philippe (*Louis Philippe*) are among those most commonly found.

Technical descriptions of varieties are unnecessary here, but the characteristics of the more important varieties are given below.



FIG. 23.—Picking Richmond cherries. From this orchard the fruit goes direct to a near-by cannery; hence, the fruit is harvested without stems. The pails in the foreground hold 5 quarts each. Tight receptacles give protection to the pickers against the juice that oozes from the wounds made in pulling off the stems. (Ohio, July 2.)

SOUR VARIETIES.

Richmond (*Early Richmond*).—The importance of the Richmond cherry is due primarily to its relative season of ripening, which is about 7 to 10 days earlier than the Montmorency; also because of its hardiness. It is the most extensively planted sour cherry of its season. The Dyehouse, which ripens at approximately the same time, is found in only a comparatively few orchards.

Montmorency (*Montmorency Ordinaire*).—This is by far the most extensively planted sour cherry, being preferred by the canners to other varieties. Were it not for lengthening the cherry season, there would be little reason for planting any of the other sour varieties now available. The tree is not considered as hardy as the Richmond, sometimes suffering winter injury when the Richmond is uninjured. In sequence of ripening the Montmorency is midseason. In the more important sour-cherry growing sections the bulk of the crop is harvested between about July 10 and 25, with naturally more or less seasonal and regional variation from these dates. There are a number of varieties in what is sometimes called the Montmorency group, and a good deal of confusion exists in regard to their identity. The varietal characters are so minute and their

resemblance to each other is so close that it is exceedingly difficult to distinguish the different sorts in this group with absolute certainty.

English Morello (Wragg).—This variety fills much the same place in the cherry industry as a late sort that the Richmond holds as an early variety. It is the principal sour variety planted to follow the Montmorency in sequence of ripening. However, it does not appear to have as wide a range southward in its adaptation as the Richmond and Montmorency. The name "Wragg" is commonly considered a synonym of English Morello, but in a few sections under



P16854HP

FIG. 24.—Picking Richmond cherries. The type of stepladder here seen is commonly used in picking cherries. (Ohio, July 2.)

the name "Wragg" the variety is much more largely planted than any other sort. In those sections the conviction prevails that there are differences which clearly distinguish it from the English Morello. The Wragg tree is said to be smaller and more productive than the English Morello and the fruit somewhat later in ripening and more acid in flavor. In other sections growers fail to see any differences between them. It is quite possible that more than one variety or strain is grown under the name "Wragg."

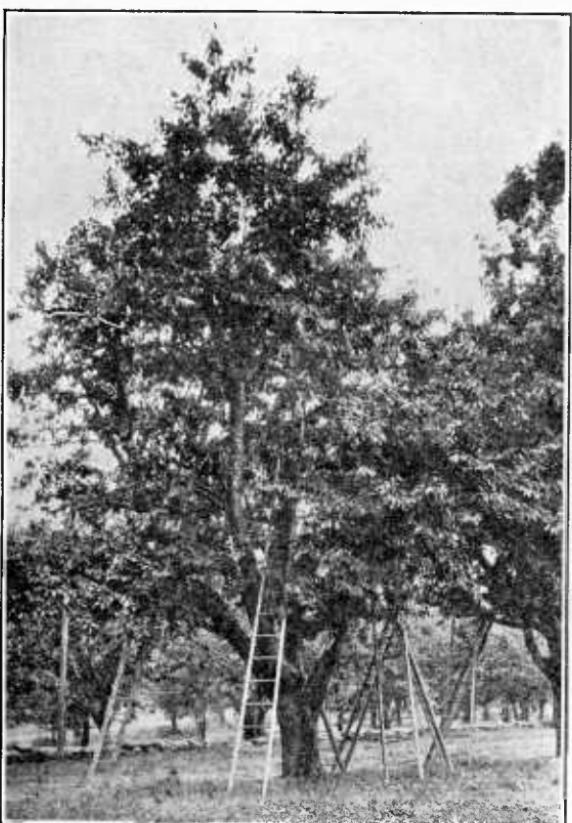
The English Morello trees are smaller than either the Richmond or Montmorency; the branches are slender and willowy with a decidedly drooping habit of growth. The foliage is very susceptible to the shot-hole fungus. Unless carefully sprayed the leaves in many cases nearly all drop in midsummer from the effects of this disease. The tree comes into bearing earlier than most sour varieties.

SWEET VARIETIES.

Seneca.—This is a very early sweet cherry originated by the New York Agricultural Experiment Station. The trees are upright in growth habit, vigorous, and hardy. The color of the fruit is very dark red to black; flesh is medium firm to soft; quality is good. The principal value of this variety is its extreme

earliness, which may be a disadvantage where birds cause considerable damage to early cherries.

Tartarian (Black Tartarian).—This variety is one of the most widely grown of the sweet sorts. The tree thrives under a wider range of soil and other conditions than most sweet cherries. The fruit is small, relatively, and not as firm as some of the other sweet sorts; but for home use it is an important variety. It is less productive than many other sweet varieties. The color of the fruit is very red to nearly black.



P16549HP

FIG. 25.—A Wood (*Governor Wood*) Cherry tree 35 or 40 years old. Its height is indicated by the ladders, which are 20 feet long. Sometimes an old tree that is very tall can be improved by topping it back heavily. (New York, June 23.)

also one of the sweet varieties most resistant to brown-rot. Though quite widely distributed in the sections where sweet cherries are grown, it is not being produced in large quantities. In season it is slightly earlier than the Windsor. The color is dark reddish.

Napoleon (Royal Ann).—This is doubtless the most important light-colored sweet cherry, not only in the cherry-growing sections in the portion of the country under consideration, but also in the cherry-producing sections of the Pacific Coast States, where it is usually known by its synonym *Royal Ann*. The tree is more sensitive to soil and other conditions than many varieties, and the fruit is very apt to crack before it is ripe unless the weather is rather

Windsor.—On the basis of the quantity of fruit produced, this variety is probably the most important midseason sweet cherry. The tree is relatively hardy and productive, though rather slow in coming into bearing. The fruit is firm and ships well. While not as good in dessert quality as the Tartarian, it is a popular market sort in the sections where it is grown. It ripens, as a rule, about with the Montmorency, though it varies from slightly earlier in some cases to a few days later. The color is very dark red, becoming nearly black.

Schmidt (Schmidt's Bigarreau).—In some sections this variety is now attracting considerable attention, which seems to be well merited. The tree has many desirable characteristics, and the fruit has the qualities of a good market cherry. It is

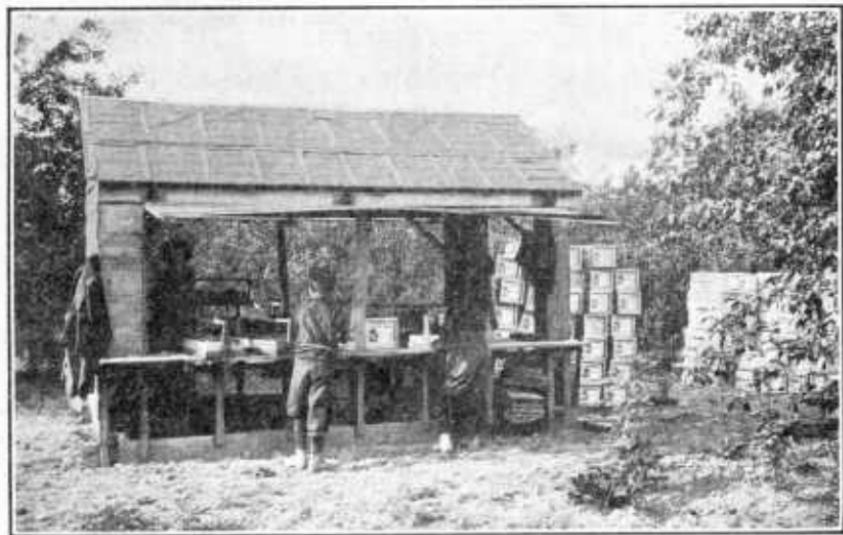
dry. It is also susceptible to brown-rot; but there seems to be no other light-colored midseason sweet cherry to take its place. The color is varying shades of bright red over a yellowish background.



PI6577HP

FIG. 26.—Packing Tartarian cherries in climax baskets. (New York, June 28.)

Spanish (Yellow Spanish).—This cherry has long been one of the most widely grown of all the sweet varieties, though it is now produced much less extensively than the Napoleon. It comes into bearing younger than many of the



PI6716HP

FIG. 27.—A movable type of packing house used in handling cherries. The 16-quart case, of which one style is shown here, is a popular package in some sections. (Wisconsin, July 13.)

other sweet sorts. Heavy losses of fruit from brown-rot sometimes occur. In season it is a few days earlier than the Napoleon. The color is bright amber yellow, with a reddish blush, slightly mottled.

DUKE VARIETIES.

May Duke.—This variety is one of the most widely grown of any in its group and has many points of merit, especially for home use and local markets. It ripens its fruit over a long period, a characteristic that is decidedly objectionable for a commercial variety. The tree is quite hardy and adapts itself to a wide range of soil conditions. In habit of growth it is upright, somewhat intermediate between the sweet and sour tree types.



FIG. 28.—A packing table of convenient design for use where very careful sorting and grading are required. (New York, June 23.)

P10550H

Philippe (Louis Philippe).—This variety in its tree characters resembles the sour cherry much more closely than it does the sweet cherry. It is a good, vigorous tree with healthy foliage. The fruit has many points of merit, as well as the tree. But, unfortunately, most growers report it to be entirely



FIG. 29.—Cherries packed in 32-quart crates for shipment to market. (New York, June 22.)

P16546H

too unproductive for commercial purposes. If it were as productive as the Montmorency, or even some of the other sour sorts, it would be a valuable cherry. The tree is said to be faulty in that the branches split down easily, much more so than most other varieties.

UNFRUITFULNESS OF SWEET CHERRIES.

Most varieties of sweet cherry are self-unfruitful, that is, they do not set fruit with their own pollen. It is not uncommon for growers to report that a variety of sweet cherry planted alone fails to bear fruit. In the Pacific Northwest, where the principal sweet-cherry varieties are Bing, Lambert, and Napoleon, it has been found that these varieties are not only self-unfruitful by themselves but are unproductive when planted together. Another variety must be planted as a source of pollen. For this purpose Black Tartarian has proved valuable as a pollinizer. In the eastern part of the country, Windsor is a valuable variety to use in addition to Black Tartarian. Sour varieties will set fruit with their own pollen but should not be depended upon as pollinizers for the sweet sorts.

THE SEQUENCE OF RIPENING OF DIFFERENT VARIETIES.

The cherry season is relatively short, and it is important that the varieties which a grower may plant shall ripen in such a sequence that he can both pick the fruit and market it to the best possible advantage.

The following list of varieties includes those of the most commercial importance and a considerable number of others that are grown more or less commonly in small lots or in home orchards. They are named as nearly as possible in the order in which they ripen.

LIST OF VARIETIES, NAMED IN THEIR APPROXIMATE ORDER OF RIPENING.

[The number in parentheses following each variety signifies (1) a sour variety, (2) a sweet variety, and (3) a Duke variety.]

| | |
|-----------------------------------------------|--------------------------------------------------------|
| 1. Seneca (2). | 15. Late Duke (3). |
| 2. Early Purple (2). | 16. Spanish (<i>Yellow Spanish</i>) (2). |
| 3. May Duke (3). | 17. Napoleon (<i>Royal Ann</i>) (2). |
| 4. Coe (<i>Coe's Transparent</i>) (2). | 18. Schmidt (<i>Schmidt's Bigarreau</i>) (2). |
| 5. Rockport (2). | 19. Elkhorn (2). |
| 6. Eugenie (<i>Empress Eugenie</i>) (3). | 20. Windsor (2). |
| 7. Kirtland (2). | 21. Ostheim (1). |
| 8. Dyehouse (1). | 22. Montmorency (1). |
| 9. Wood (<i>Governor Wood</i>) (2). | 23. Large Montmorency (1). |
| 10. Richmond (<i>Early Richmond</i>) (1). | 24. Bessarabian (1). |
| 11. Tartarian (<i>Black Tartarian</i>) (2). | 25. English Morello (<i>Wragg</i>) ¹ (1). |
| 12. Philippe (<i>Louis Philippe</i>) (3). | 26. Lutovka (1). |
| 13. Olivet (3). | 27. Brusseler Braune (1). |
| 14. Eagle (<i>Black Eagle</i>) (2). | 28. Magnifique (<i>Belle Magnifique</i>) (3). |

The order in which the names are listed indicates the sequence in which they ripen, as nearly as it is possible to determine it from available data, though the sequence of ripening varies more or less in different years, even in the same orchard, as well as in different orchards; for instance, some growers report the Windsor as earlier, others as later, than the Montmorency. This variation should be kept in mind when making comparisons with this list.

¹ See the comment concerning the identity of the English Morello and *Wragg* on page 31.

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